

REMARKS

The Office Action dated November 29, 2006, has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto.

By this Amendment, claims 1, 3 and 5 have been amended and claims 6 and 7 have been added. No new matter is presented. Claims 1, 3 and 5-7 are pending and respectfully submitted for consideration.

Rejections Under 35 U.S.C. § 102

Claims 1, 3 and 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Clauss et al. (U.S. Patent 5,251,405, "Clauss"). The Applicant traverses the rejection and respectfully submits that claims 1, 3 and 5 recite subject matter that is neither disclosed nor suggested by Clauss.

Clauss discloses a method for circumferential grinding of radially non-circular workpieces including a grinding machine 10 comprising a grinding wheel 11 revolving about an axis in a direction indicated by 12. A cam 15 has a basic circular section 16, i.e., an area of constant radius, and in addition a raised section 17, i.e., an area where the cam 15 displays a radially non-circular shape. The cam 15 is part of a camshaft which is mounted in the grinding machine 10 along a second axis 18, chucked by its longitudinal axis. During machining of the cam 15 by the grinding wheel 11, the latter engages the periphery of the cam 15 at a point of action 20. The cam 15 is rotated about the second axis 18 at predetermined angular steps and the grinding wheel 11 simultaneously is reciprocated along the first axis 13, in a predetermined way. The grinding machine 10 is further equipped with a length-measuring device 25. The length-

measuring device 25 comprises two measuring jaws 26, 27 which contact the cam 15 from above and below. The measuring jaws 26, 27 are adapted to follow the shape of the cam, measuring during this movement the actual radius R . In the position of the cam 15 illustrated in Fig. 1, the upper measuring jaw measures a value R_1 which almost corresponds to the maximum elevation of the cam while the lower measuring jaw 27 measures a value R_2 equal to the basecircle radius R_G of the cam 15 in the base-circle segment 16. See column 5, line 14 to column 6, line 5 of Clauss. Clauss further discloses a numerical control device 42 connected to data outputs 43 and 44 for the motion units of the X axis, i.e., the first axis 13 and the C axis, i.e., the second axis 18. See column 6, lines 60-63 of Clauss.

To the extent that the above-noted rejections remain applicable to the claims currently pending, the Applicants traverse the rejections and respectfully submit that claims 1, 3 and 5 recite subject matter that is neither disclosed nor suggested by the cited references.

Claim 1 recites a first step of detecting a predetermined lift amount, between the base circle portion and the cam lobe, of the outer peripheral surface of a workpiece at a given point to index a standard phase of the workpiece, and a second step of advancing or retreating a rotary grindstone by an NC control based on the standard phase of the workpiece indexed at the first step to grind the outer peripheral surface of the workpiece.

Claim 3 recites a standard phase-indexing means for indexing a standard phase of a workpiece and this phase-indexing means comprises a standard phase sensor for detecting a predetermined lift amount, between the base circle portion and cam lobe, of

the outer peripheral surface of the workpiece at a given point. An NC control unit is provided for advancing and retreating a rotary grindstone to grind the outer peripheral surface of the workpiece based on the standard phase of the workpiece indexed by the standard phase-indexing means and previously input data for the profile of the workpiece.

Since the predetermined lift amount between the base circle portion and cam lobe of the cam is detected and the standard phase of the cam is indexed, according to the invention, the indexing of the standard phase of the cam can be performed properly even if a special recess is not formed around the outer periphery of the camshaft. See page 2, line 24 – page 3, line 8 of the Specification as originally filed. The claimed invention provides a decrease in the grinding margin of the cam, thus, leading to a shorter grinding time.

In Clauss, on condition that one of two sensors or measuring jaws 26, 27 necessarily measures the actual radius R of the base-circle segment 16 of cam 15, a smaller one of the values R_1 , R_2 measured by the measuring jaws 26, 27 is compared with a setpoint value R_{GS011} . When the deviation between the smaller value R_1 or R_2 and the setpoint value R_{GS011} in Clauss is reduced to a level desired, the grinding is terminated. Thus, in Clauss, the values detected by the measuring jaws 26, 27 are obtained during the grinding operation for indicating to what extent the grinding of the cam 15 as a workpiece has been proceeded. The values detected by the measuring jaws 26, 27 in Clauss are not at all used for detecting a predetermined lift amount, between the base circle portion and the cam lobe, of the outer peripheral surface of a workpiece at a given point to index a standard phase of the workpiece as recited in

claims 1 and 3. Nor does Clauss disclose or suggest the second step of advancing or retreating a rotary grindstone by an NC control based on the standard phase of the workpiece previously indexed at the first step so as to grind the outer peripheral surface of the workpiece.

As such, Clauss fails to teach or suggest any device or means for indexing a standard phase of a workpiece and any device or means for grinding an outer peripheral surface of a workpiece based on the standard phase indexed by such indexing device or means, as recited in claims 1 and 3.

According to U.S. patent practice, a reference must teach every element of a claim in order to properly anticipate the claim under 35 U.S.C. § 102. In addition, “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628,631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “Every element of the claimed invention must be arranged as in the claim. . . . [t]he identical invention must be shown in as complete detail as is contained in the patent claim.” Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989) (emphasis added). The Applicant respectfully submits that Clauss does not disclose or suggest the features of the claims 1, 3 and 5 as arranged in the claims. Accordingly, Claus does not anticipate claims 1, 3 and 5, nor are claims 1, 3 and 5, obvious in view of Clauss. As such, the Applicant submits that claims 1, 3 and 5 are allowable over the cited art.


Conclusion

The Applicant respectfully submits that claims 1, 3 and 5 are allowable. Claims 6 and 7 depend from claim 3. The Applicant further submits that each of these claims incorporate the patentable aspects thereof, and are therefore allowable for at least the same reasons as discussed above. Accordingly, the Applicant respectfully requests withdrawal of the rejection, allowance of claims 1, 3 and 5-7 and the prompt issuance of a Notice of Allowability.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing Attorney Dkt. No. 107348 -00482.**

Respectfully submitted,



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